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EDITORIAL

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RUSSIA'S FIVE-YEAR PLAN

Lately there has been much discussion about the success or failure of Russia's Five-Year Plan. In 1928 Nicolai Lenin determined to try out this plan. In brief it is this: by 1933 the Soviet government means to make Russia the leading industrial nation of the world. They mean to double their output of steel, oil, and coal; triple their metal production, and quadruple their manufacture of machinery.

The two great drawbacks to this plan are the government's lack of credit and the nation's lack of capable leaders to oversee this work. The first is offset by Russia's large supply of raw materials, such as ores, wood, and grain. These they ship out in large quantities in return for machinery. The second drawback is taken care of by employing engineers from foreign nations. At present there are two thousand engineers from America and one thousand from other nations working there.

When these two obstacles were overcome, a great improvement was instantly noted. In 1921 Russian factories were producing only 17 per cent of their pre-war output. In 1930, when the plan had been in effect only two years, these factories were producing 180 per cent that of 1913, or more than ten times that of 1921. With these facts before us, there is little doubt but that the Five-Year Plan will succeed, but with this conclusion economists find many disturbing factors. Can this great development be kept within bounds, or will it break out and bring havoc and ruin to Europe and America? Few at present are capable or daring enough to answer this question.

Included in Soviet Russia's Five-Year Plan is the construction of a huge dam in the River Dnieper at Kicklas, in Ukraine. When completed it will furnish twice the power generated at Niagara. The construction work is under the

supervision of an American, Colonel Hugh L. Cooper, builder of the Wilson Dam at Muscle Shoals and chief engineer of the erection of the Niagara plant. Under him, he will have five other American engineers and 17,000 workmen.

When finished, this enormous hydro-electric plant will supply 2,500,000 kilowatt hours to a territory of 70,000 square miles. It will be one and a quarter miles long, two hundred feet high and will contain 1,150,000 cubic yards of concrete. There will be a power house 820 feet long, with nine turbines of 85,000 horsepower each, and an ultimate combined capacity of 850,000 horsepower. The turbines, built by the Newport News Shipbuilding and Drydock Co., are the largest in the world.

Half of this project is now finished. Working at top speed in five-day weeks, the 17,000 workmen have placed more concrete than has ever before been placed in a similar period in the history of engineering. In one month they placed 114,400 cubic yards.

COST OF WASTE EVERY YEAR IS EIGHT BILLIONS

Waste costs American industry and business between \$8,000,000,000 and \$10,000,000,000 annually, Department of Commerce experts estimate. They also believe waste is responsible for an annual toll of more than 30,000 lives. Progress has been made in recent years in eliminating some of this waste, much of which is due to faulty distribution methods, although failure to utilize by-products accounts for some of it. Many millions have been saved by standardizing machinery and parts. Production has gone far in solving its waste problem, but the distributing end still offers room for vast improvement. The lives lost were from motor and industrial accidents.

—Exchange.

MARCH, 1931

SUPER-POWER RADIO

Many persons are now advocating a complete revision of our radio broadcasting system. They are in favor of eliminating all the small stations and substituting about ten or fifteen super-power stations of about twice the power of our present large stations. The chief argument in support of the proposed change is that by using more powerful stations and fewer of them, there will be no interference between stations and listeners will be given better service.

This all sound very well, but let us consider the past and present situations. In the early days of broadcasting there were many stations on the air but of comparatively low power. The idea of chain broadcasting was unthought of. In order to be popular, a station had to offer the kind of programs that its listeners wanted to hear. Now we have the national chains and hookups with almost all the powerful stations affiliated. There is no doubt that their programs as a whole are better than those of the individual stations. But not all individuals enjoy the same type of program. Under the present system, unless a listener has an unusually selective receiver, he is forced to listen to the chain broadcast of "The Hot Shot Spark Plug Company" the "Strong Cup Coffee Hour" or some other "feature," whether he likes their programs or not. Since there are but few chains, he has little choice of programs.

Engineers and scientists are working on a plan which would enable all the chain stations to operate on the same wave-length at the same time. This would make room for more stations on the air at the time. Like all other engineering problems, it is only a matter of time until it will be solved.

Now suppose that the broadcasting service were limited to fifteen super-power stations. If they were all to operate on different wave-lengths as chain stations, they would constitute a monopoly of the air. If they were to operate on the same wave-length, the commercial advantage of chain advertising would be greatly diminished and the chains would be financially unprofitable. Some propose government subsidy such as the British system. The British Government leases the broadcasting rights to a private company which controls all stations. Such a system is not in keeping with our policy of government. Just what will eventually develop is a matter which we can only speculate upon.

THE FACTOR OF SAFETY IN DESIGN

Professor Frank Mickle, Assistant Professor of Mechanical Engineering, University of Michigan, Ann Arbor, has an interesting article on the subject of "Factor of Safety in Design" in the March issue of *Mechanical Engineering*, wherein he discusses the uses of the two definitions of the term "factor of safety." Since 1914, Professor Mickle has been on the teaching staff of the department of mechanical engineering at Michigan and has spent his time in the teaching of machine design. For the past seven years he has carried on some commercial work for the Economy Baler Company of Ann Arbor in the design and development of an electrically driven cotton compress. He is also active on the Sectional Committee of the A.S.M.E. for the standardization of herringbone gears.

MARCH, 1931

MARTYRS

Considerable comment has been provoked by the number of advertisements of campus social functions that appeared in our January issue. Most of these comments may be boiled down to the simple question, "Since when has the engineer become a social sort of an animal?" We wonder.

It appears to us, after quite a bit of observation, that a great number of engineering students are discarding that old idea that one must be a martyr to the profession while in college; that one must forego all activities and social functions that differentiate college life from that of the correspondence school. This subject has been stated, in a very abstract manner, as the slide-rule *versus* trombone controversy. A large number of us hold that in order to be a good engineer, or at least, a good engineering student, one must be on the books every night and spend a good deal of each week-end in the library or writing up those voluminous reports that distinguish so many of our technical courses; this is the "slide-rule" idea. The other camp is of the opinion that a certain amount of social activity, the exact amount to be determined by the individual after a series of experiments, interspersed with studying, will benefit the student far more than the straight diet of text-books; this, of course, is the "trombone" viewpoint.

Successful engineers advocate recognition of the social side of professional life and admit that a great measure of their success can be traced to contacts made out of the purely technical path. An analogy is found in college life. It may be observed that the popular engineering student is the one who has made contacts outside of his college, not, of course, forgetting that after all he is still an engineer.

We do not consider that the college is becoming "white-collared" (in the derogatory sense) if it supports campus social events but that it is awakening to the fact that after all it is an integral part of the University and that it realizes that engineers have just as much, if not more, of a place in the sun as the members of any other college.

May we refer you to page one of this issue?

BRIDGING THE KILL VAN KULL

The bridge having the longest arch span in the world is in the process of construction across the Kill Van Kull, between the states of New York and New Jersey. The central arch span will be twelve hundred feet long and will thus exceed by a few feet the length of the former longest span.

Engineers decided upon the arch-span type of bridge because of the heavy traffic on the water and because of the wonderful foundation afforded for this type of bridge at this point.

The bridge will have a total length of one and two-thirds miles, and the roadway has been made wide enough to accommodate four lanes of traffic. If necessary, two tracks for rapid transit trains or two additional vehicular traffic lanes may be added.

The arch is a two-hinged, parabolic structure, constructed entirely of manganese steel. The two hinge bearings are of forged steel and weigh sixty tons apiece.